

## CLAIMS

1/ A method of measuring the propagation time of an ultrasound signal between two spaced-apart transducers constituting an emitter and a receiver, the emitter  
 5 transducer being subjected to an excitation signal comprising  $n$  successive pulses of period  $T_e$ , thereby causing an ultrasound wave to be emitted towards the receiver transducer, said ultrasound wave generating a receive signal at the output from the receiver  
 10 transducer, said method being comprising the following steps:

- beginning a measurement of an intermediate propagation time when the emitter transducer begins to be excited;
- 15 • detecting the receive signal at the output from the receiver transducer and counting the oscillations in said receive signal;
- stopping measurement of the intermediate propagation time when an  $i^{\text{th}}$  oscillation is detected; and
- 20 • determining the propagation time of the signal by taking the difference  $T_{\text{int}} - i \times T_e$ .

2/ A method according to claim 1, wherein measurement of the intermediate propagation time is stopped for an  $i^{\text{th}}$   
 25 oscillation of the receive signal that corresponds to the receive signal being at a maximum amplitude.

3/ A method according to claim 1, wherein measurement of the intermediate propagation time is stopped for an  $i^{\text{th}}$  oscillation of the receive signal, where  $i \neq 1$ .

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4/ A method according to claim 1, wherein the measurement of the intermediate propagation time is stopped for an  $i^{\text{th}}$  oscillation of the receive signal, where  $i=n$ .

10 5/ A method according to claim 1, wherein measurement of the intermediate propagation time is stopped for an  $i^{\text{th}}$  oscillation of the receive signal, where  $i=4$ .

15 6/ A method according to claim 1, wherein measurement of the intermediate propagation time is stopped for an  $i^{\text{th}}$  oscillation of the receive signal, where  $i=5$ .

7/ A method according to claim 1, wherein the excitation signal is made up of  $\underline{n}$  pulses, where  $n \neq 1$ .

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8/ A method according to claim 1, wherein the excitation signal is made up of  $\underline{n}$  pulses where  $n=4$ .

25 9/ A method according to claim 1, wherein the excitation signal is made up of  $\underline{n}$  pulses where  $n=5$ .

10/ Apparatus for measuring the propagation time of an ultrasound signal, the apparatus comprising:

- means for forming an excitation signal;
- an emitter transducer connected to said means for  
5 forming an excitation signal;
- a receiver transducer to transform the ultrasound signal into a receive signal; and
- comparator means connected to said receiver transducer to compare the amplitude of the receive signal  
10 with a trigger threshold voltage and to generate a signal representative of oscillations of said receive signal;

the apparatus being characterized in that it further comprises:

- means for measuring a fixed time connected to said  
15 means for forming an excitation signal in order to measure a fixed time from the instant at which the emitter transducer is excited;
- means for determining an  $i^{\text{th}}$  oscillation, which means are connected to said comparator means, to count  
20 the number of oscillations in the receive signal and to detect the  $i^{\text{th}}$  oscillation; and
- means for measuring a variable time between the end of measuring the fixed time and detecting the  $i^{\text{th}}$  oscillation.

11/ Apparatus for measuring the propagating time of an ultrasound signal according to claim 10, wherein the means for measuring a fixed time comprise a counter and a decoder.

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12/ Apparatus for measuring the propagating time of an ultrasound sound according to claim 10, wherein the means for determining the  $i^{\text{th}}$  oscillation comprise a counter and a decoder.

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13/ A device for measuring the propagation time  $T_p$  of an ultrasound signal according to claim 10, wherein the means for measuring the variable time comprise a time expander circuit.

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